REPORT OF THE MULTIPLE USE TRAIL GUIDELINES TEAM

Purpose

The purpose of the Multiple Use Trail Guidelines Team was to recommend trail development guide lines that would accommodate a variety of trail users on a common trail alignment. The consideration for such usage is to integrate hike/runners, equestrians, mountain bicyclists, physically-challenged, where feasible, and potentially other non-motorized trail users all into a common system. The intent of the team was to discuss among members of different trail user groups and trail design experts known and potential concerns and conflicts between users and to recommend design guidelines to minimize user conflicts. This report recommends guidelines to ensure safe and enjoyable trail experiences, with minimal impact to natural resources.

Process

The team is made up ofrepresentatives from hiking, equestrian, and mountain bicycling user groups, and two agency people with trail design experience, who also represented physically-challenged trail user needs. Several meetings were held to discuss the various issues between users and a field trip to Point Mugu State Park and the newly constructed Guadalasca multi-use trail was also conducted. Additionally, several of the committee members observed the Oak Creek Canyon Whole Access Trail and portions of the Los Robles Trail in the Conejo Open Space Conservation Agency system in Thousand Oaks. Design criteria were then developed from this discussion and a review of a selection of trail manuals and standards from several federal, state, local and other trail publications.

Context

In arriving at recommended guidelines for construction of new multiple use trails, the team discussed a number of considerations for and concerns about multiple use trails. The consensus of the team was that the recommended guidelines (described in more detail in the next section) were workable for the construction of new trails that are planned for multiple use and would allow a safer mix of trail users. The team considered, but did not arrive at a consensus, as to how the guidelines should be applied to *existing* trails. The issues and concerns considered by the team are described here to provide a context for the recommended guidelines and to give trail managing agencies broader perspective on how to implement the recommendations.

1. Trails at the trailhead points should be broader, accessible to the physically-challenged, and signed to clearly state rules, regulations, degree of trail difficulty and other important trail use and safety information. Several team members felt trails close to the trailhead access point would experience the greatest use and potential conflicts. As trails progress further away from the access point, the number of users diminishes, allowing a better application of the proposed multi-use trail guidelines, reducing signage

needs, and lessening potential impacts to the environment.

2. The equestrian and hiking representatives felt that there were definite conflicts between their use and mountain bicyclists' due to the speed differential between such users. The turnouts, sight distance, trail running grade and trail width were influenced by these concems. The equestrian and hiking team members supported the design guidelines for new trails, but had difficulty in applying the guideline to existing trails.

3. The mountain bicyclist representatives were supportive of the multiple use guidelines since they propose use over narrower trails than fire roads and other broader trails. The mountain bicyclists supported these guidelines and also supported utilizing single-track trails narrower than the proposed guideline widths to provide them the same type of aesthetic trail experience as other trail users.

4. The team considered parallel or single-use trails as an altemative to multi-use trails. Agency representatives offered that the financial capability of public agencies and the potential impact to the environment of such trails limited their ability to develop them. They also felt that there were benefits from a trail system that could incorporate trail users into a common corridor for trail maintenance and policing.

5. The team considered how the guidelines could be applied to existing trails. Research revealed one method of applying trail guidelines to existing trails is used by the Mid-Peninsula Open Space Agency. This method uses a standard that if 75 percent of a trail met their multi-use guideline the trail could be designated as a multiple use trail. Additionally, that if 75 percent was compatible, mitigation measures should be taken to modify the remaining 25 percent of the trail into conformance[1]. The team did not reach consensus on recommending a similar or different application of the guidelines to existing trails. Some members felt that any existing trail, before it could be considered for multiple use, must be in 100 percent compliance with the proposed guidelines or be brought up to meet the guidelines. For instance, if a trail did not meet the guidelines along a portion of its length, that section should be reconstructed or bypassed. Other members felt compliance with the guidelines should not be the sole determinant of whether or not an existing trail could be considered for multiple use. They felt agencies should consider a number of factors such as use statistics, maintenance needs, safety concerns, resource issues as well as trail dimensions and physical characteristics before determining trail use.

Recommendations

The recommended guidelines for construction of *new* multiple use trails are in a design feature chart (see Table 2) that addresses the trail dimensions and construction techniques to provide a trail capable of supporting safe and enjoyable multiple use trail experiences.

The main users were assumed to be hikers, equestrians and mountain bicyclists. Trail runners were considered as capable of fitting the proposed guidelines without any special design changes. It was discussed that all trails, where it was practical, should provide accessibility for the physically-challenged. The U.S. Architectural and Transportation Barriers Compliance Board has developed recommendations for accessibility guidelines for recreational facilities and outdoor developed areas in a draft form. Although not officially adopted, these federal Americans with Disabilities Act (ADA) guidelines imply that accessible trails may be adaptable within the proposed dimensions in the guidelines, and that the more hardy, physically-challenged trail users may be encountered further into trail systems in the future. Discussion was held in relation to other users such as skateboarders, slalom boards, skaters and mountain-type wheelchairs. There did not appear to be an adequate amount of information on such usage, nor did there seem to be any known

extensive use of such equipment on the existing trail systems. These uses, therefore, were not included in the recommended guidelines.

The proposed widths and other aspects of the guidelines do not vary greatly from those used by other trail managers. Each trail design feature in the accompanying table has identified sources that support the selection of the particular guideline. The vegetation clearing guideline, for example, is taken from six other trail documents. The recommended minimum tread width of 48" is supported by several documents. Another supports a dimension up to 60 inches as the maximum tread width.

The proposed guidelines are specifically for the construction of new trails only and were determined by the team to be functional for new multiple use trails. The team did not agree as to how to apply these guidelines to existing trails. They therefore do not provide any recommendations concerning the application of these guidelines to existing trails. The guidelines in Table 2 on the next page are intended to provide recommended construction designs for new multiple use trails and promote the basis for fundamental uniformity for trails within the Santa Monica Mountains area. Numbers in italics refer to the source material which is listed in the next section. For definitions and visual examples of the trail design features, please see Attachment D.

Implementation Recommendations

I-15. For new trails planned for multiple use, agencies should follow the recommended trail guidelines and design criteria to provide a safe and enjoyable trail experience for anticipated trail users.

1-16. At trailheads, access points, and areas of major use, agencies should construct wider and more accessible trails for the physically-challenged and anticipated multiple trail users. Additionally, this should be an area providing clear signage with information and guidelines for trail users. At a distance from the trailhead, where fewer users can be anticipated, agencies should apply the guidelines contained in this team report.

Table 2: Multi-Use Trail Design Features and Recommended Guidelines for Construction of New Trails

Trail Design Feature	Recommended Guideline
Alignment	Layout should fit to the terrain. Trail should follow the contours of the area. (curvilinear) *(2,3, 4)*
Grade	Max. Pitch - 10% slope; Max. Sustained Pitch - 12% slope; 15% slope may be allowed for short sections depending on the physical and environmental constraints. Percentage of slope is expressed in vertical rise per 100 feet of run.) *(2, 4)*
Clearing (Vegetation)	Min. Width - 8 ft.; Height - 10 ft.; for 48" to 60" tread (*1, 2, 3, 7, IO,11)*
Tread	Min. - 48"; Max. - 60" for multi-use classification. *(l, 2,* 3*, 8, I I)*
Line of Sight	1. Min. +/- 85 feet for trail grades of 5-10% 2. Min. +/- 50 feet for trail grades of 10-12% and at blind turns *(2, 4, 5)*
Bench Construction/ Sideslopes	1. Sideslopes between 10 to 30 percent, excavation of the trail bed shall be constructed with a balance section of 1/2 cut and 1/2 fill. 2. Sideslopes between 30 to 50 percent, will require a 3/4 bench cut with 1/4 fill construction to accommodate the trail bed. 3. Sideslopes above 50 percent, the entire trail shall be full bench cut construction. *(2, 4, 7, 8, 9)*
Outslope	2%-5% from uphill (inside) edge to outside edge of trail *(1, 2)*
Climbing Turn	Constructed on sideslopes less than 30 percent *(4)*
Switchbacks	Curve constructed on sideslopes from 30% to 45%. Switchback curve is established with a 6-foot radius at the inside of the turn. The maximum grade entering the turn shall be 5% maximum for 15 feet. The turn should be flat if possible *(1, 2, 3, 4, 7, IO, 11)*
Turnouts/Passing Sections	1. Trail grades between 5%- 10% placement at +/- 500 ft. 2. Trail grades between 10%- 12% placement at +/- 100 feet. *(2, 6)*
Vista Points	Vista points should be developed at significant outlook areas that will allow for rest and an aesthetic visual experience *(2)*
Rolling Grade Dip	A cross drainage swale that is placed at 45" to the trail with a flow line of 4% from uphill to downhill with rock rip-rap outfall. This provides a smooth transition for trail runners and mountain bicyclists *(1, 2, 3, 8)*

Table 2 (cont.)

Sources:

1. California Park Service in cooperation with Summer Youth Employment and Training Program; **Trail Crew Pt. Mugu State Park, 1994.**

2. Gilmore, Jim, Park Development Planner, and the Conejo Open Space Trail Advisory Council, **Conejo Open Space Conservation Agency Trail Manual Draft,** Thousand Oaks, Califomia, 1997.

3. Hooper, Lennon, Trails Coordinator, **National Park Service Trails Management Handbook,** The National Park Service, Denver, Colorado; publication date unknown.

4. McCoy, Michael, Bike Centennial; and Stoner, Mary Alice; USDA Forest Service Missoula Technology and Development Center; **Mountain Bike Trails: Techniques for Design, Construction and Maintenance;** Bike Centennial, Missoula, Montana, 1991.

5. Mid-Peninsula Regional Open Space District, **Trail Use Policies,** adopted by Board of Directors, November 1990.

6. Moore, Roger **S., Conflicts on Multiple-Use Trails: Synthesis of the Literature and State of the Practice,** Federal Highway Administration, 1994.

7. Newton B. Drury, Northcoast Redwoods District, **California Conservation Corps. Parkway Trailhead Development,** March, 1994.

8. Olson, Jana, Trails Coordinator, and Hom, Hanson; **A Trail Manual for the East Bay Regional Park District,** East Bay Regional Park District, Oakland, California, 1976.

9. Padilla, Frank, Jr., State Park Ranger with California Department of Parks and Recreation; and Loheit, Kurt, Trail Coordinator with Off-Road Bicycle Association; **Introduction to Basic Trail Maintenance,** 1992.

1O. United States Forest Service, Arroyo Seco District Angeles National Forest and the High Adventure Team, Los Angeles Area Council Boy Scouts of America, **Trail Boss Program and Practice,** 1993.

11.Vogel, Charles, **Trails Manual;** Equestrian Trails, Inc., Sylmar, Califomia, 1982.

Team Members

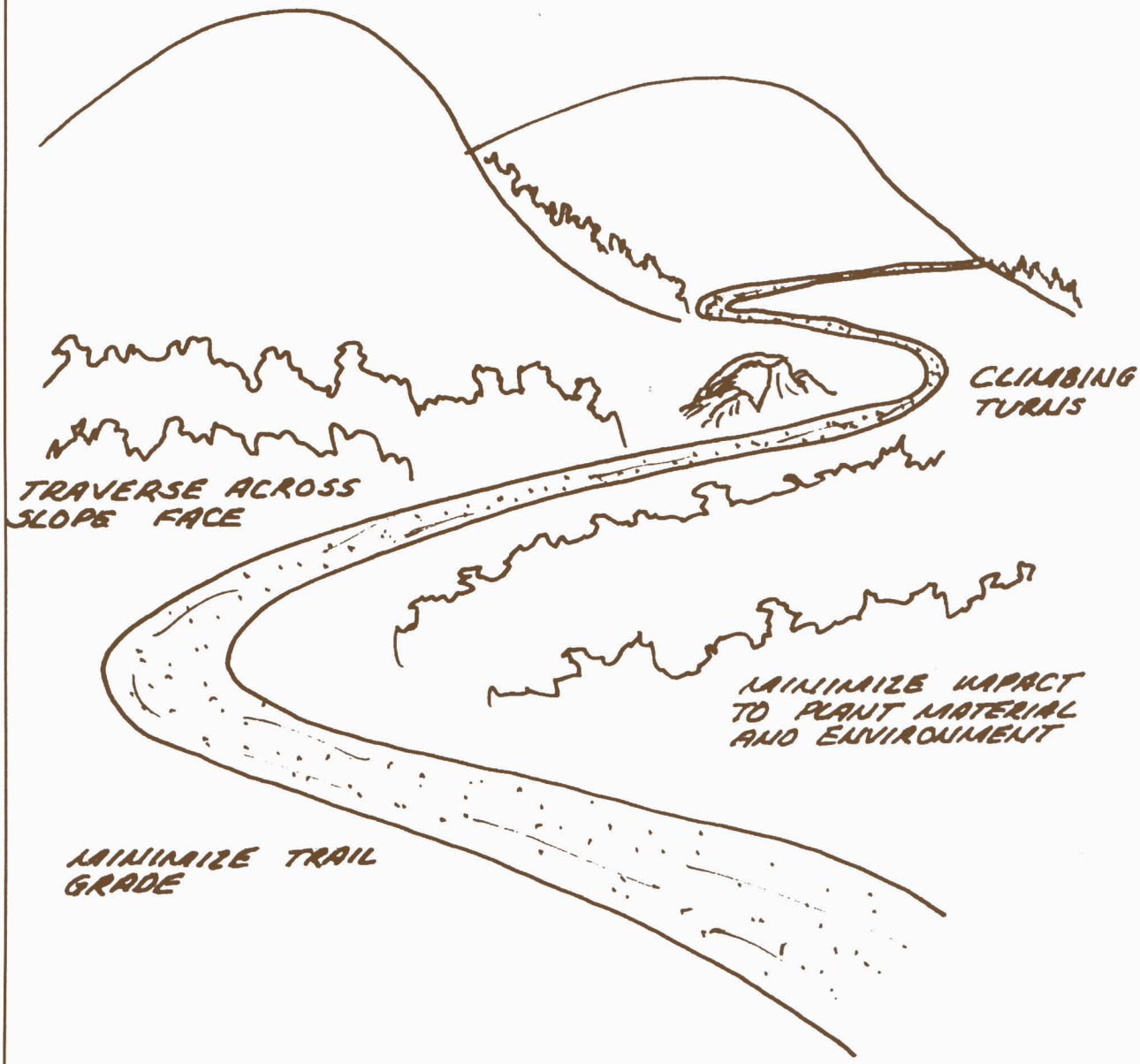
Frank Padilla, Jr., California Department of Parks and Recreation; *Jim Gilmore,* Conejo Recreation and Park District/Conejo Open Space Conservation Agency; *Lou Levy,* Sierra Club/Inner City outings; *Dun Bernstein,* Concerned Off-Road Bicycle Association; *Grant Gerson,* ETI-Corral 63, Santa Monica Mountains Trail Council, Malibu Trails Association; *Kurt Loheit,* International Mountain Bicycling Association; *Jim Hasenauer,* International Mountain Bicycling Association; *Bob Garsen *,* Sierra Club; *Ken Klemantis,* Sierra Club, *Kathy Blansett*,* Rancho Simi Park District.

Had only minimal participation

Attachment D: Definitions and Visual Examples of Trail Design Features

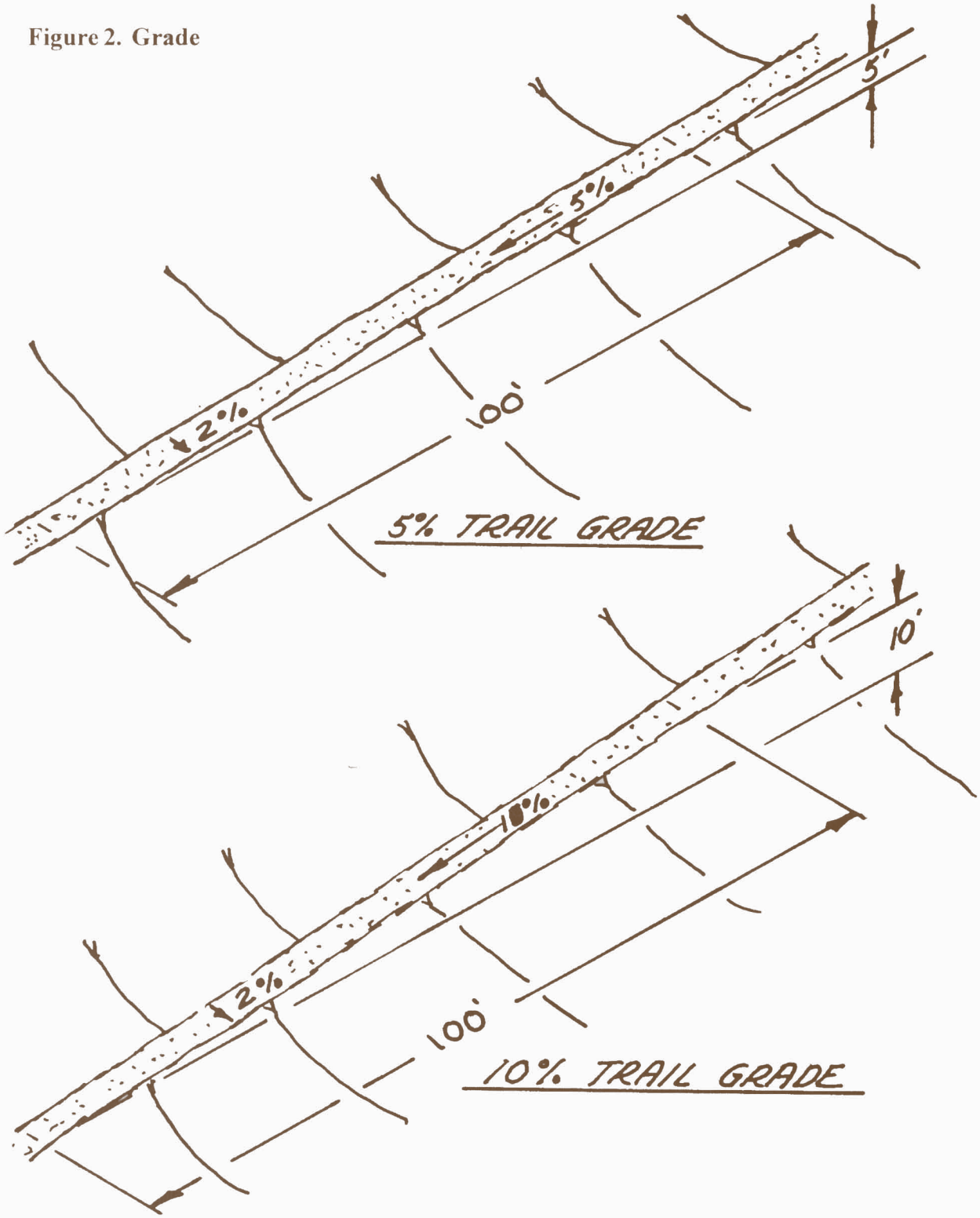
Alignment:
The course of a trail in connecting a beginning and ending point. Generally designed to fit the terrain through which it passes with a minimum of impact and construction.

Figure 1. Trail Alignment Planning



Grade:
The actual climb or descent in the trail, measured in percentage of slope determined by amount of vertical change in a 100-foot horizonal distance.

Figure 2. Grade

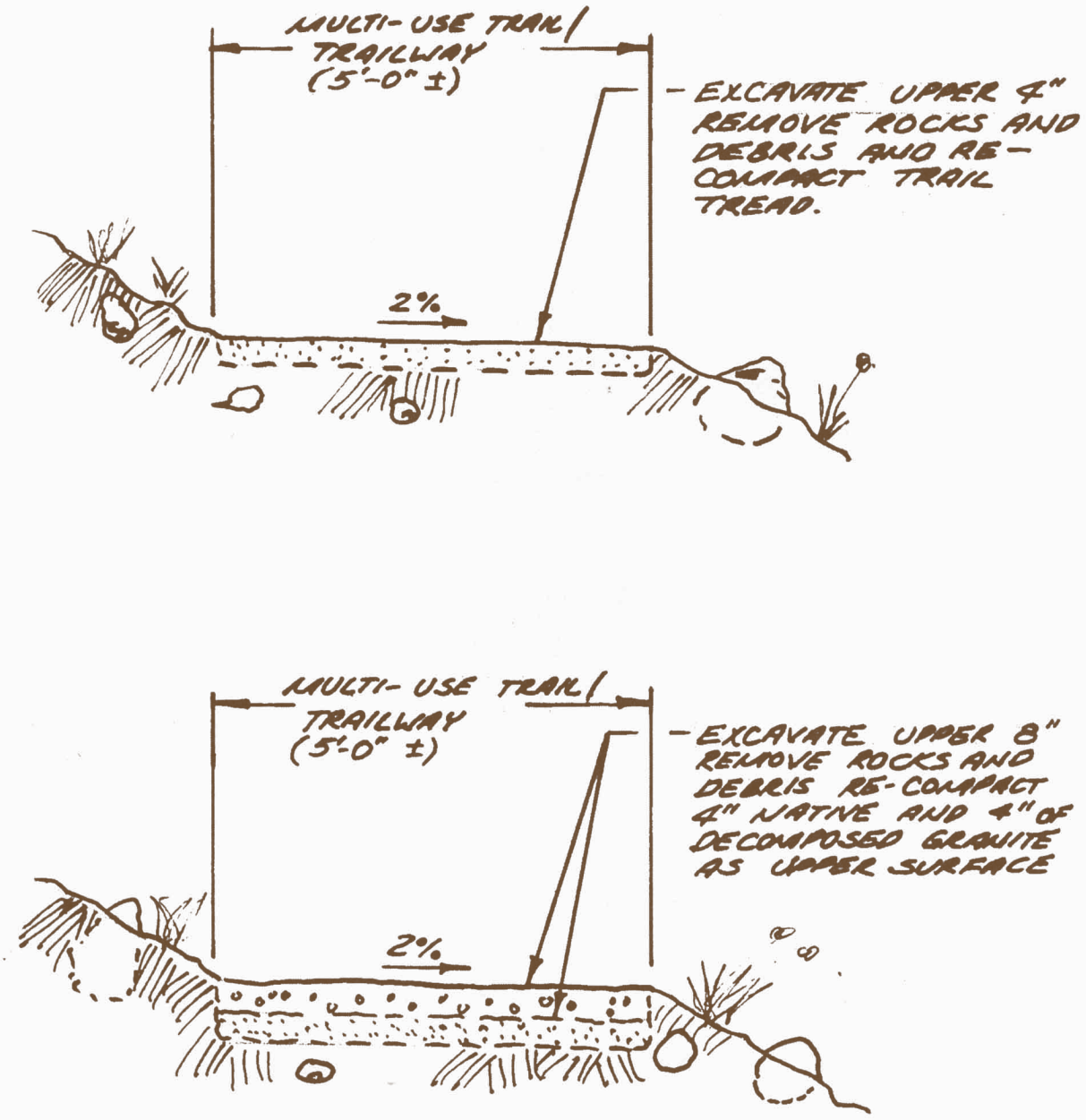


Attachment D (cont.):

Trail Tread:
The actual surface of the trail used for traffic.

Trailway:
That portion of the trail within the limits of the inner edge of the excavacation and the outer edge of the fill or embankment.

Figure 3. Trail Tread



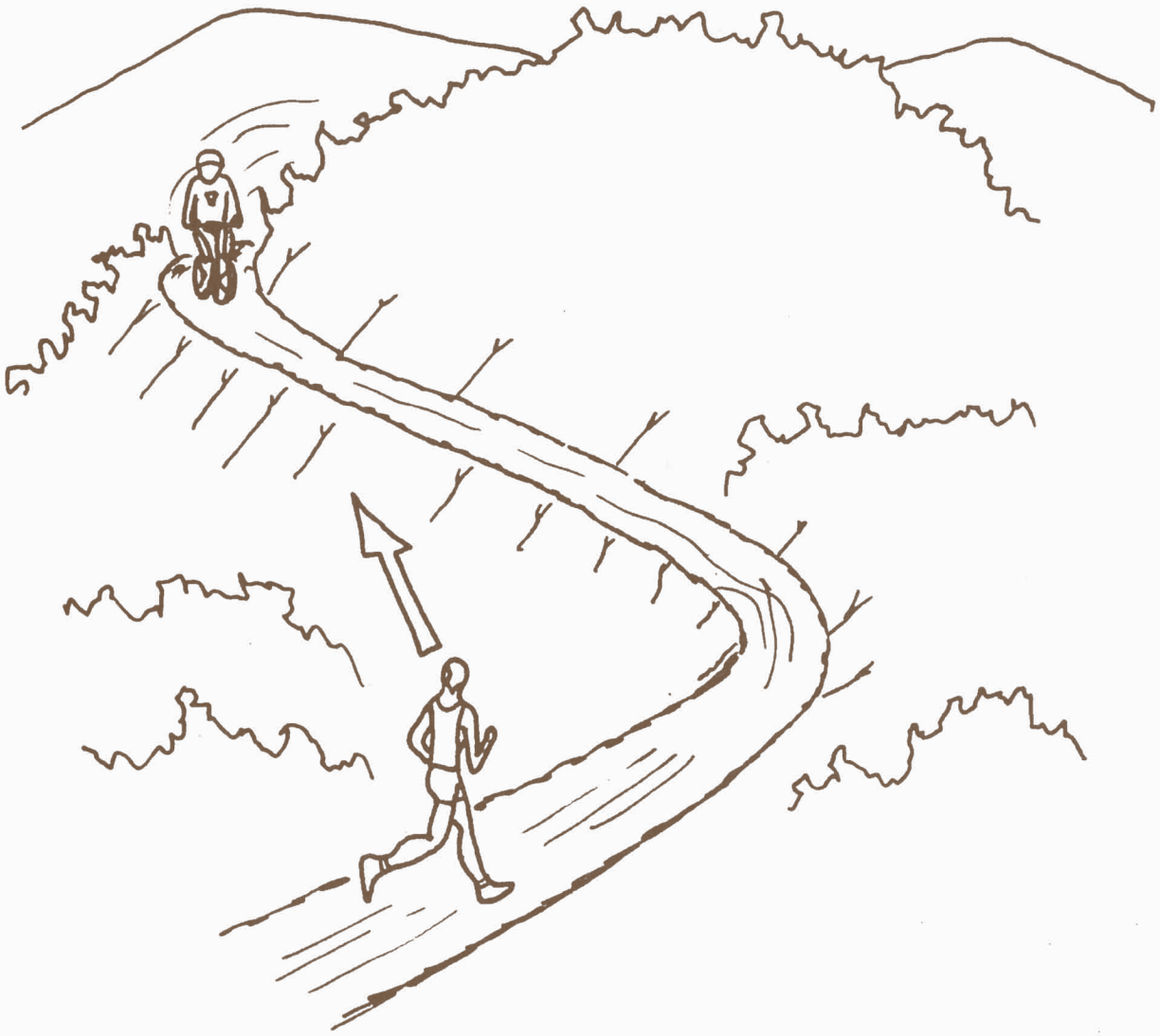
Clearing Limits:
The area of a trail from the surface of the trail to the bottom of the lowest overhanging objects, and from edges of the cut shrubs and branches.

Figure 4. Trail clearances

Attachment D (cont.):

Line of Sight:
The distance that one trail user can see another trail user ahead. In multi-use trails, the sight distance is based on the speed of trail users approaching, and the grade of the trail, to allow the ability to avoid conflict.

Figure 5. Line of Sight

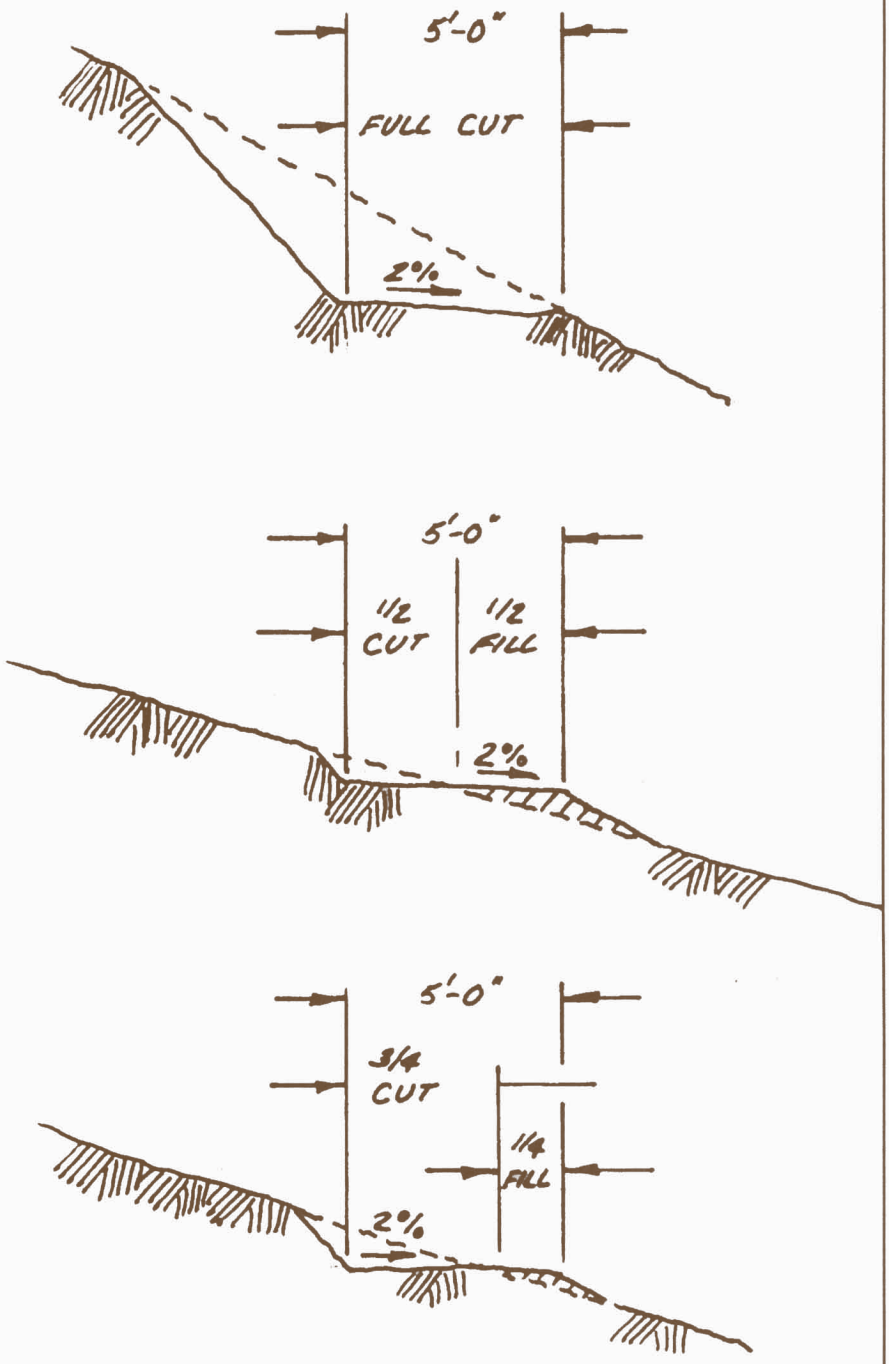


Full Bench:
Where the trailbed is comprised of a full cut into the sideslope or the terrain is flat enough to not require any fill.

3/4 Bench:
Where the trail cut is 3/4 of the trail width and 1/4 is fill on the downhill side.

1/2 Bench or Balanced Section:
Where the trail cut is 1/2 of the trail width and 1/2 is fill on the downhill side.

Figure 6. Bench Construction

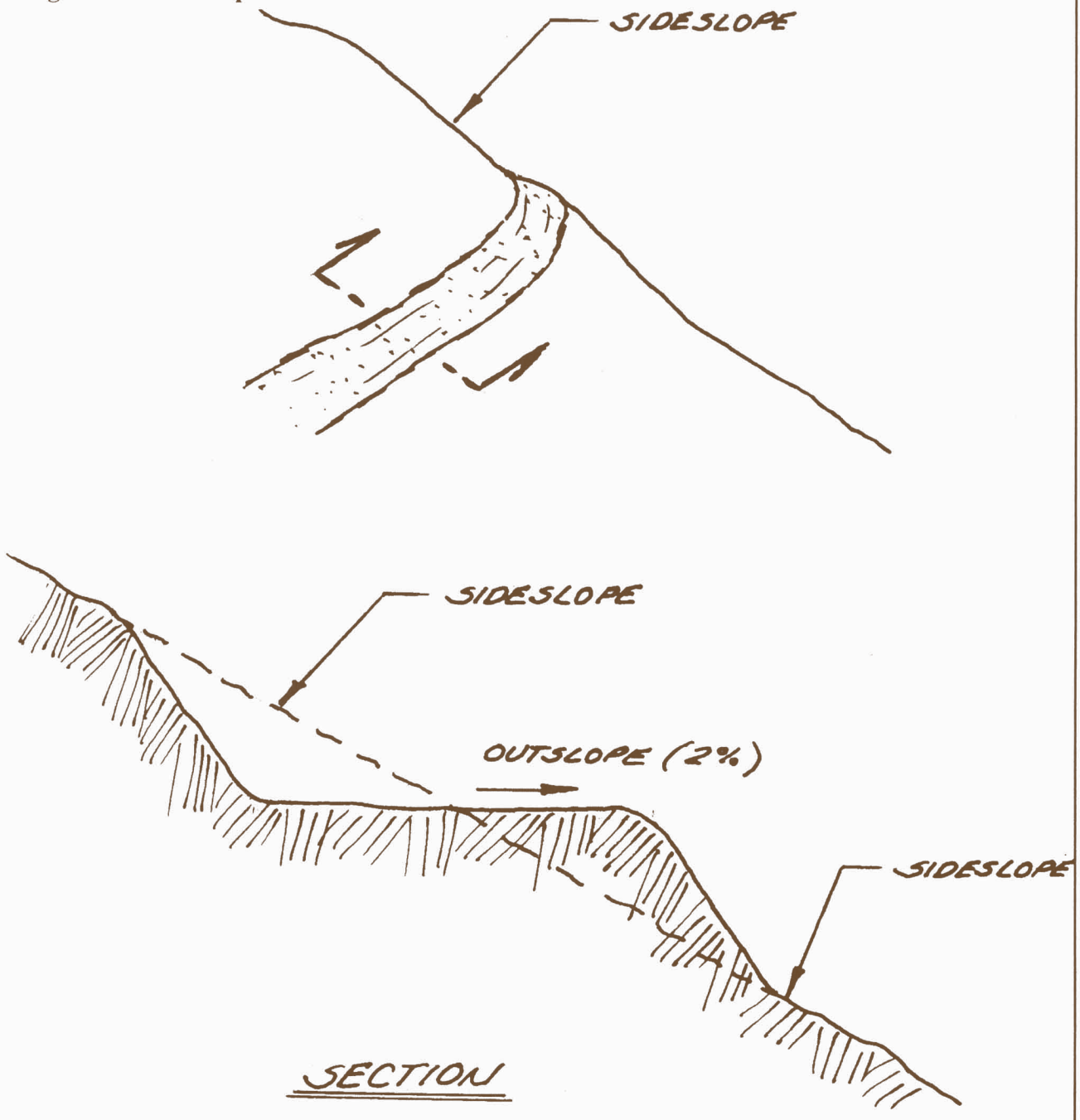


Attachment D (cont.):

Sideslope:
Sideslope refers to the terrain or slope in percentage grade of a hillside across which a trail is to be constructed.

Outslope:
The trailbed is sloped outward toward the embankment or downhill side of the trailway. In a full bench cut, the outward edge is also referred to as the daylight line.

Figure 7. Cross Slope

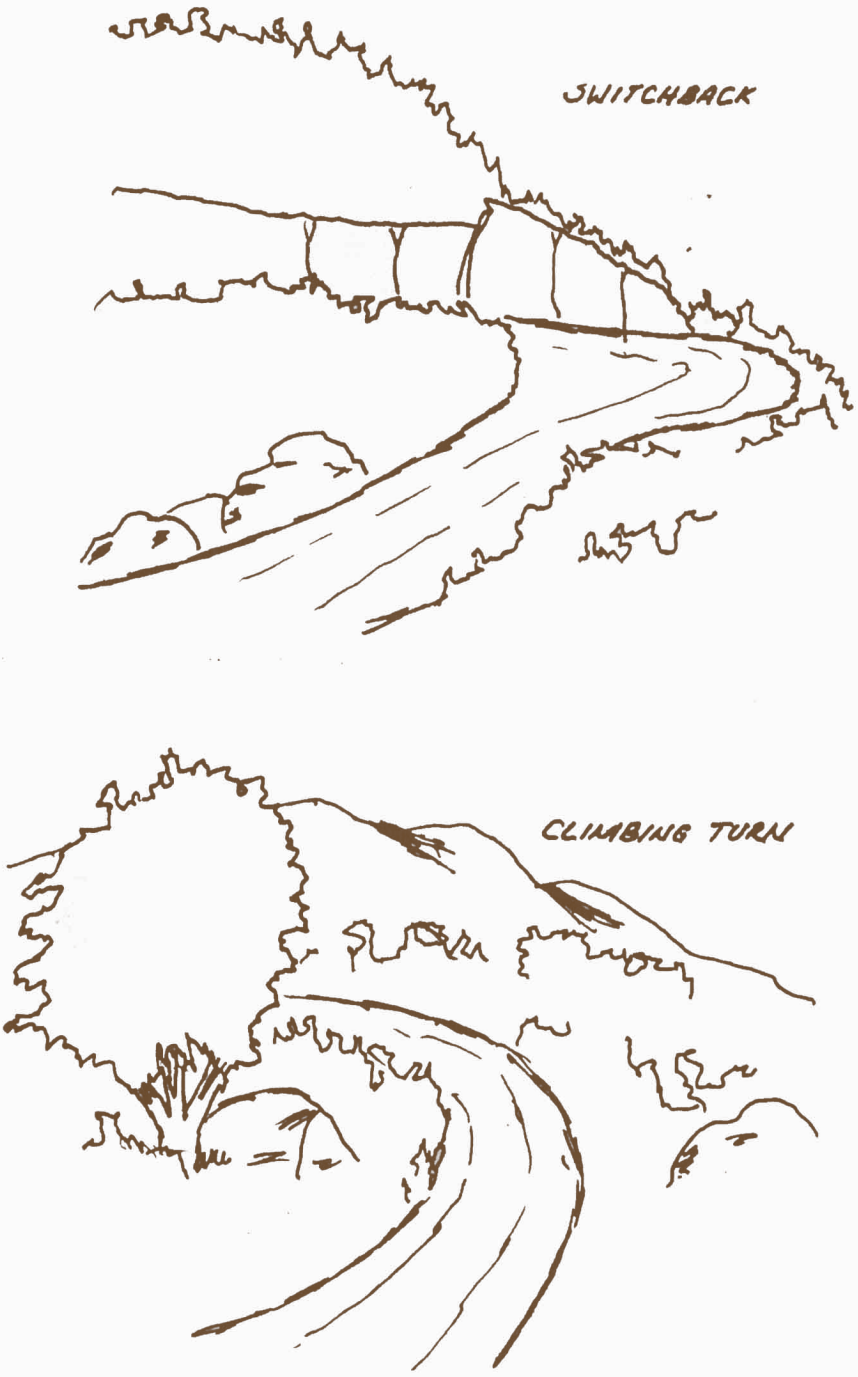


Climbing Turn: A turn constructed on a sideslope of 30% or less when measured between the beginning and end of the turn and the change in direction of the trail is between 120°-180°.

Switchback: A turn which is constructed on a sideslope of more than 30% when measured between the beginning and end boundaries of the turn and changes the direction of the trail 120° to 180°.

Curve Radius Length: The length of the radius to the inside curve on a turn, usually on a switchback.

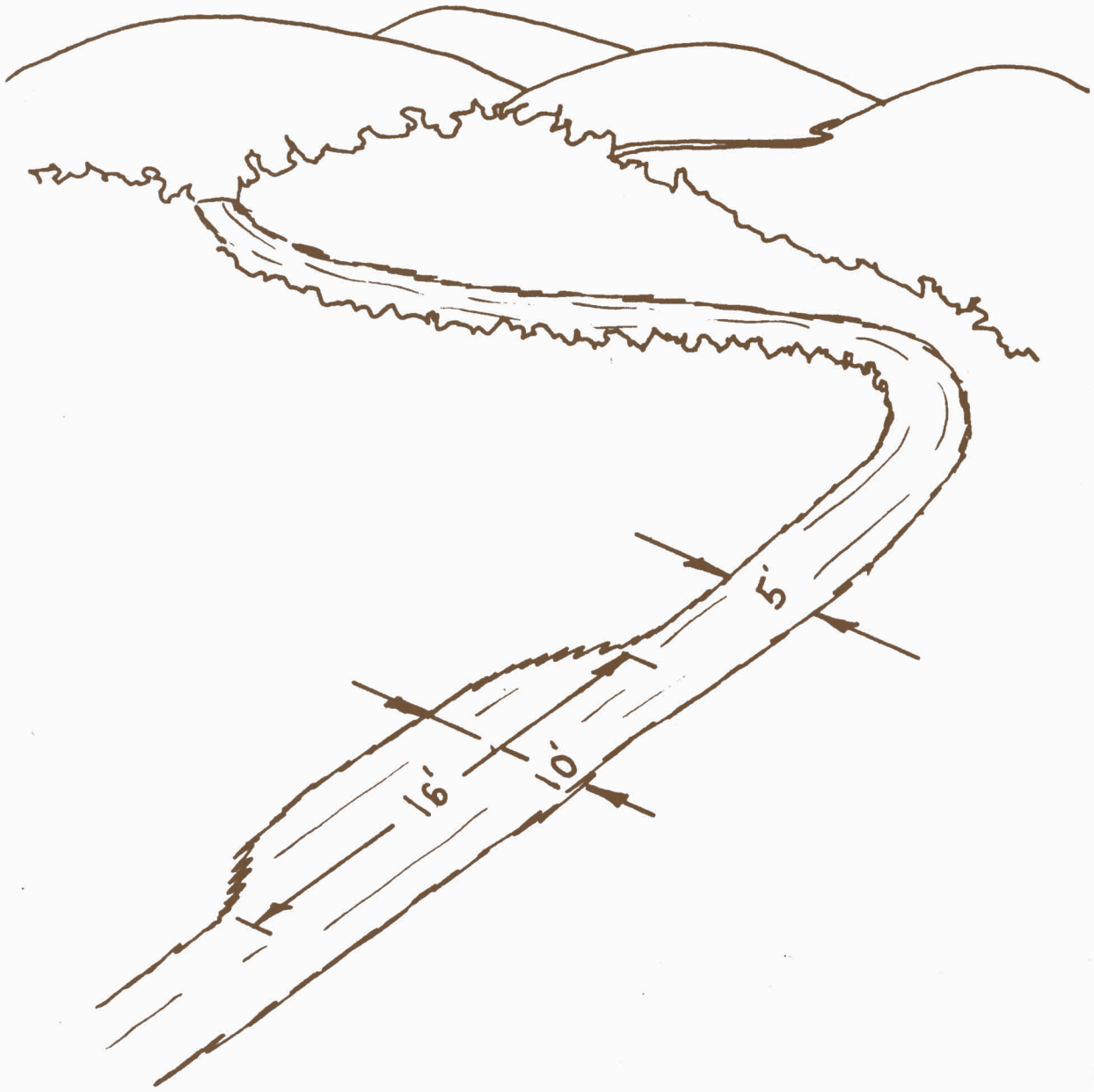
Figure 8. Switchback and Climbing Turns



Attachment D (cont.):

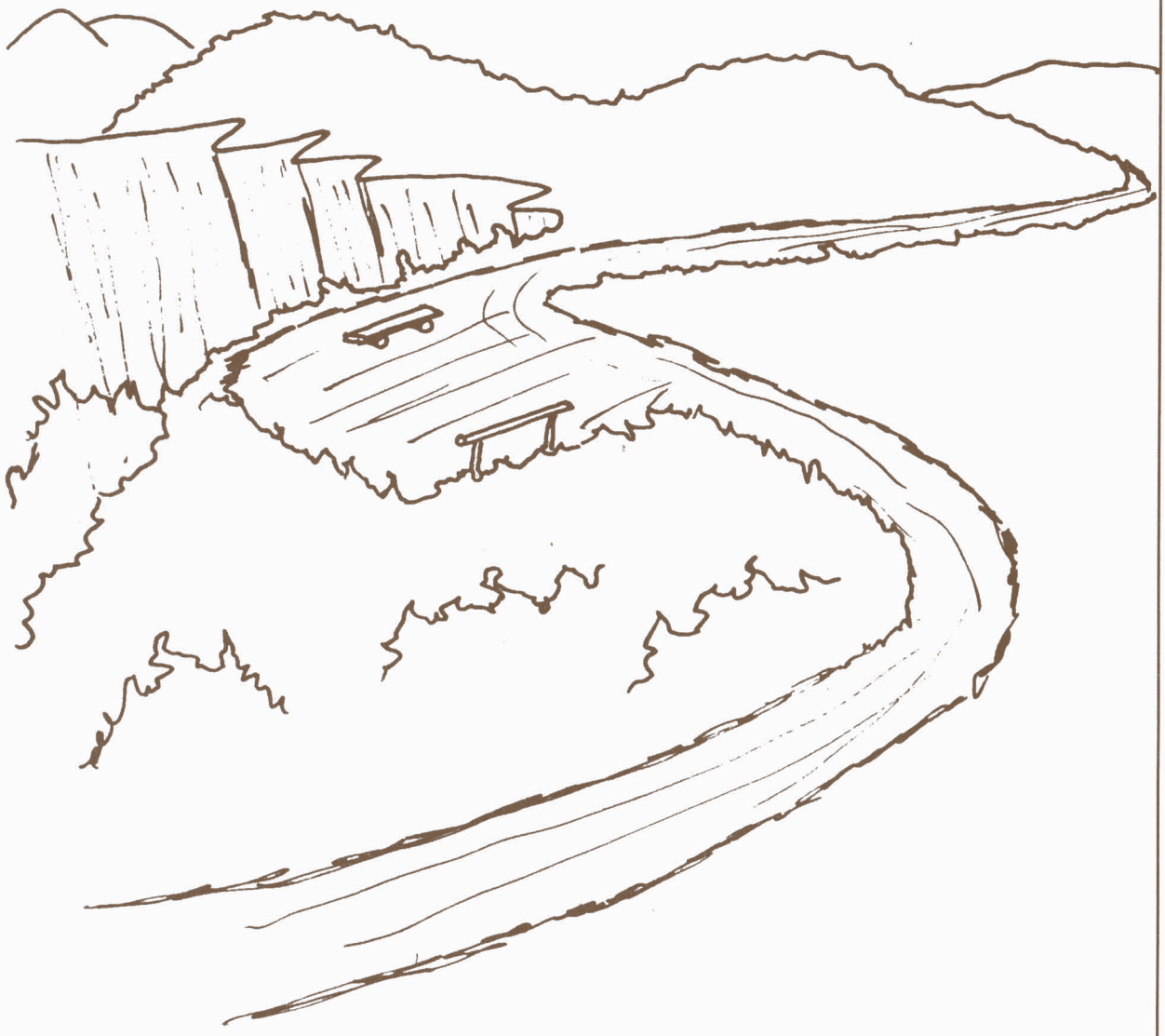
Turnouts/Passing Sections:
Areas for opposing trail users to yield to others by stepping or moving aside to allow others to pass. In the multi-use system the mountain bicyclists speed and the slope of the trail is used to determine the distance. The passing width is usually twice the tread and approximately 16 feet long.

Figure 9. Turnout/Passing Section



Vista Points:
Rest or stopping areas that allow trail users to leave the active trail area and stand or sit in an area adjacent and view the surrounding environment while not interfering with active trail users.

Figure 10. Vista Point



Rolling Grade Dips:
The rolling grade dip is graded at a 45° angle to the trail descent and consists of a 20-foot wide swale with side slopes and a 4% flow line across the trail from high side to low side. The diversion side of the swale on the low end of the running grade of the trail is 5 feet wide. Rock rip-rap is utilized at the swale outfall.

Figure 11. Rolling Grade Dips